

## EMC Corporation IT Department



### EMC IT moves business-critical applications to Symmetrix V-Max for ultimate efficiency and performance

In the last five years, EMC® Corporation's revenues have grown from \$8.23 billion to nearly \$15 billion and the company has acquired more than 40 firms. On a daily basis, EMC processes nearly 25 million transactions with its customer relationship management (CRM) application alone and receives nearly two million e-mails from outside the company. Unstructured files are becoming increasingly media-rich, and e-mails and documents more frequently contain charts, photos, and other large graphics files.

The impact of these changes on EMC's information infrastructure has been huge. EMC's storage capacity has doubled from 3.3 to 6.6 petabytes in only three years. Databases and applications have proliferated across the company with significant redundancy of data and IT resources.

Managing such rapid expansion would be challenging in any situation, but in addition, EMC has committed to deep cost reductions across the company to increase competitiveness and profitability. To meet these demands, EMC IT began seeking alternative solutions.

#### Challenge

- Dramatic business expansion with growing requirement for agility
- Rising costs associated with fast-growing information infrastructure
- IT under pressure to reduce or maintain budget levels

#### Solution

- EMC Symmetrix V-Max infrastructure with storage tiering and virtual provisioning

#### Key benefits

- Average 62 percent reduction in processing time for main finance batch jobs
- Storage utilization target increased from 65 to 75 percent due to virtual provisioning
- Flash drives generated data center power and cooling savings and performance improvements

#### Increased storage capacity, performance, and business agility

EMC's IT infrastructure is spread across five data centers globally, with the majority of the environment residing in two sites in Massachusetts. To reduce headcount, floor space, and capital expenditures, EMC IT has implemented a number of consolidation efforts. For example, they have consolidated 47 EMC CLARiiON® systems to 11 CLARiiON CX4 arrays. Cost avoidance of \$3 million over five years also has been achieved due to reduced requirements for data center space, energy, maintenance, and other IT resources.

EMC IT was looking to further increase performance and scalability of its EMC Symmetrix® DMX™ storage environment. As a first step, EMC has moved its Oracle data warehouse and Microsoft® Exchange® environments to EMC Symmetrix V-Max™ storage. EMC also is migrating its Oracle enterprise resource planning (ERP) to Symmetrix V-Max.

The Symmetrix V-Max infrastructure includes five percent Enterprise Flash drives (EFD), 70 percent Fibre Channel drives, and 25 percent SATA drives.

#### Sixty-percent data-center footprint reduction expected by 2011

Since deployment, Symmetrix V-Max has provided EMC with significant improvements in performance, efficiency, and scalability. For example, Symmetrix V-Max high-performance Enterprise Flash drives yielded immediate performance gains over the Symmetrix DMX Fibre Channel drives.

Sadasiva Prathab, EMC's IT storage director, said, "Fibre Channel drives normally give 180 IOPS per drive, but EMC Flash drives provide 2,000 IOPS. This has helped us meet our data warehouse requirements of 100,000-plus IOPS with a minimal number of drives. For example, performance improvements have ranged from 60 percent up to 300 percent for our global data warehouse workloads. With just 15 Flash drives doing the work of nearly 200 Fibre Channel drives, we've recovered our Flash drive investment."

EMC's data warehouse organization has reported additional Flash drive performance improvements:

- Execution time for near-realtime data was reduced from three hours to 56 minutes
- 62 percent reduction in commissions batch processing time
- 77 percent reduction in rendering of business intelligence (OBIEE) dashboards and drilldowns
- Average 62 percent reduction in processing time for main finance batch jobs

Prathab says, "The Flash drives are helping us to populate our data warehouse with fresh data much more quickly. This means sales, finance, and other groups can get at this information faster and make better decisions."

In addition, EMC IT expects that continued consolidation onto Symmetrix V-Max and Flash drives will result in a data center footprint reduction by at least 60 percent by 2011 and dramatic savings in power and cooling.

### No trade-offs—only improvements

Jon Peirce, vice president, EMC IT Global Infrastructure Services, said, "V-Max and EFDs have enabled us to increase performance and deliver higher service levels to our application users. In addition, we have been able to dramatically reduce costs and improve productivity. There have been no tradeoffs—only improvements."

Performance increases and reduced costs also have resulted from Symmetrix V-Max virtualized storage tiering and auto-provisioning, which uses virtual LUNs to move data non-disruptively across EFDs, Fibre Channel drives, and SATA drives with varying levels of RAID protection. For example, EMC's backup timeframes were decreased by 25 percent due to backup copies being assigned to specific storage pools and the use of multiple dedicated storage paths.

In EMC's V-Max environment, high-transaction production data is assigned to Flash drives, slightly aged production data to Fibre Channels, and inactive, low-performance test and development and historical data to SATA. Storage tiering provides the flexibility to enable tier selection dictated by an application's requirements for performance, availability, capacity, and cost. To achieve greater efficiency, storage tiering will be totally automated with EMC FAST technology in 2010.

Symmetrix V-Max virtual LUN functionality and auto-provisioning also make it easier to support internal customers who need to make frequent changes to their tier selections due to shifting requirements.

"We don't need to constantly monitor how usage is growing," said Prathab. "Instead, we create storage pools with different performance characteristics and automatically expand that infrastructure whenever it's needed. As a result, we can increase our storage utilization from 65 to 75 percent."

In addition, Symmetrix V-Max is helping EMC increase the average number of terabytes managed by individual EMC IT full-time equivalents (FTEs) from 185 to 262 terabytes.

Looking ahead, EMC IT is planning for Symmetrix V-Max to be a major component of its virtualization strategy and journey to private cloud.



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